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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/515,517	02/29/2000	Michael Lounsbury	1252.1044/JRB	1702

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EXAMINER

WERNER, BRIAN P

ART UNIT

PAPER NUMBER

2621

DATE MAILED: 08/19/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/515,517

Applicant(s)

LOUNSBERY, MICHAEL

Examiner

Brian P. Werner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 February 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2&4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The three copending related applications cited in the first sentence of the specification should be updated to reflect their corresponding issued Patent Numbers and Dates as follows:

- 09/116,553 was issued as patent number 6389154 on 5/14/2002
- 09/164,089 was issued as patent number 6307555 on 10/23/2001
- 09/219,613 was issued as patent number 6553337 on 4/22/2003.

Information Disclosure Statement

2. The information disclosure statement filed with the application fails to comply with 37 CFR 1.98(a)(2)(iii), which requires a legible copy of each pending U.S. application including the specification, claims and drawings. In the IDS, the three patent applications discussed immediately above are cited without providing the requisite copies. However, these three applications have matured into U.S. patents. Therefore, the examiner suggests filing a supplemental IDS citing the issued US patents for consideration.

Claim Objections

3. The following quotations of 37 CFR § 1.75(a) is the basis of objection:

(a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

4. Claims 7, 8 and 10 are objected to under 37 CFR § 1.75(a) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery.

In claim 7, at line 2, "bas" should be corrected to "base".

In claim 8, at line 8, the claim refers to "the path" and "the level", even though a path and a level have not yet been established in the claim. This is a bit confusing in that, up to this point in the claim, there are not paths or levels referred to. Claim 8 does eventually establish a "path" and "level" at lines 12-13. However, in order to understand line 8, one has to read lines 12-13. Stated another way, it is not clear how leading zeros can be disregarded in the "path" before the "path" is even established by the claim. From the disclosure, it appears that first the path has to be established, and then the lead zeros can be disregarded. For example, claim 4 properly recites this temporal order. Clarification in the claim is requested.

Claim 10 is a "method" claim that improperly depends from the "system" of claim 8. Claim 10 will be assumed to depend from the method of claim 9 for examination purposes. Correction is required.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 13-16 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Independent claim 13 is directed to a computer readable storage having a data structure that defines a subdivision surface (e.g., a polygon mesh) having a “base identifier field, a vertex index field and a path field of a path to a surface face”. This type of data qualifies as non-functional descriptive material. Such non-functional descriptive material is non-statutory. Refer to MPEP 2106(IV)(B)(1)(b), which states:

“Descriptive material that cannot exhibit any functional interrelationship with the way in which computing processes are performed does not constitute a statutory process, machine, manufacture or composition of mater and should be rejection under ...”.

In the case of claim 13, the data embodied on the computer readable medium does not fall under any of the statutory categories, and does not exhibit any functional interrelationship with the way in which a computing process is performed. The claim defines a mere arrangement of image data, without claiming any functionality imparted onto the computer that reads the data. Dependent claims 14-16 are rejected on the same grounds.

To expedite a complete examination of the instant application the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected over the prior art as set

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for the below in anticipation of applicant amendment these claims to place them within the four statutory categories.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 5, 6, 9, 11, 13, 15 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsuboi et al. (Triangular Mesh Generation Using Knowledge Base for Three-Dimensional Boundary Element Method; IEEE publication).

Regarding independent claims 1, 9, Tsuboi discloses a system (figure 1) comprising:

an input source providing a polygonal base mesh having a face (e.g., figure 5(a) depicts a base mesh of a cube; it has plural faces; for exemplary purposes, the face identified by vertexes 5, 6, 7 and 8 [i.e., the top of the cube] will be referred to as "the face" as claimed); and

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a computer analyzing the mesh (e.g., figure 1) and determining an identifier for the face comprising a

base face identifier (figure 5(b); “shape” and “(4 3 2 1)” identifies a base, or first face of the cube by virtue of its corners, or vertexes; this is the base face because it is the first in the data structure);

vertex index (figure 5(b); the “node number” column provide an index to the locations of the vertexes, including vertexes 5, 6, 7 and 8 associated with the claimed “face”); and a

path to the face (figure 5(b), the “coordinates” associated with the vertex index provide a path to the vertexes that outline the face; FURTHER, this limitation is also met by virtue of the “shape” data structure, which provides a path to the claimed “face”).

Specifically regarding independent claim 11, the polygon mesh is displayed from the above data structure by traversing the path to the face using the base face index and the vertex index.

Specifically regarding independent claim 13, the data structure is stored on a computer readable medium (i.e., figure 1) for subsequent transmission or display.

Regarding dependent claims 5 and 15, the vertex names are unique (i.e., each “node number” in figure 5(b) is unique, as well as its coordinates).

Regarding dependent claims 6 and 16, the edge names are unique (i.e., looking at figure 5(b) in the “shape” table, the edges are defined by sets of vertexes; for example, in the example “face” used above [i.e., face 5 6 7 8], an edge is defined by

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vertexes 5 to 6; this edge is unique because no other edges are present between these two vertexes).

9. Claims 1-4 and 9-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Samet (Applications of Spatial Data Structures; cited by applicant).

Regarding independent claims 9 and 11, Samet discloses a method of determining a unique identifier for a face of a mesh in a subdivision surface (a mesh subdivision surface is depicted in figure 1.1. (c); face "10" will be used as an example below), comprising:

determining a base mesh face (figure 1.1 (d), root node "A" corresponds to the "entire array" as described at page 4, line 1 and thus it is a base mesh);

determining a vertex index of the face (figure 1.1. (d), the vertex associated with face "10" is labeled as "D"); and

determining a path to the face (the entire tree structure depicted in figure 1.1 (d) depicts the path to face "10").

Specifically regarding independent claim 11, the face "10" is accessed by traversing the tree structure of figure 1.1. (d).

Regarding dependent claims 10 and 12, a subdivision level is determined for the face (i.e., "level 0" in figure 1.1 (d) corresponds to face "10").

Regarding claims 1-4, from the Samet disclosure, it is clear that the algorithms recited therein are performed using a computer, as computer program code is disclosed. Further regarding claim 3, Samet discloses representing the above tree

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structure using a fixed bit integer (section 2.1; "locational code" and "an integer" at the first paragraph under section 2.1). Regarding claim 4, leading zeros of an integer are always disregarded, as they do not contribute to the number.

10. Claims 1, 2, 7 and 8-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Certain et al. (Interactive Multiresolution Surface Viewing; ACM publication).

Regarding independent claims 1, 9, Certain discloses a system (e.g., "workstation" at section 4) comprising:

an input source providing a polygonal base mesh ("base mesh" at section 3) having a face (looking at sections 3 and 3.1, a tree structure describing the entire multiresolution mesh is disclosed; the "base mesh" has a plurality of "faces", and each of those faces have "four children", each corresponding to higher resolution faces, and each of those children can have four children, each corresponding to higher resolution faces, etc.); and

a computer (i.e., the "workstation" at section 4) analyzing the mesh and determining an identifier for the face (i.e., the data structure of section 3.1 identifies any specific face) comprising a

base face identifier (all faces are linked by the tree structure to the "base face" from which it is a child; e.g., "array of pointer to face" at section 3.1)

vertex index ("corner vertex" and "edge vertex" at section 3.1); and a

path to the face (the tree structure provides the path; e.g., "array of pointer to face", "array of pointer to vertex", etc.)

Specifically regarding independent claim 11, the polygon mesh is displayed from the above data structure by traversing the path to the face using the base face index and the vertex index ("mesh is rendered by traversing the tree Q" at section 3).

Specifically regarding independent claim 13, the data structure is stored on a computer readable medium for subsequent transmission or display.

Regarding dependent claims 2, 7, 10, 12 and 14, the identifier comprises a level indicator ("level: Integer" at section 3.1).

Regarding independent claim 8, the elements recited therein are met by Certain as described in the preceding rejections above.

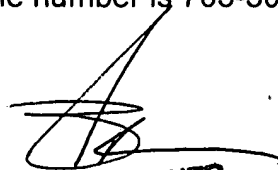
Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Werner whose telephone number is 703-306-3037. The examiner can normally be reached on M-F, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H. Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

Brian Werner
Patent Examiner



BRIAN WERNER
PRIMARY EXAMINER